

12 May 2004
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Ann Prichard
Senior Environmental Research Scientist
Pesticide Registration Branch
Department of Pesticide Regulation
1001 I Street
P.O. Box 4015
Sacramento, CA 95812-4015

RESPONSE TO CALIFORNIA NOTICE 2004-4
REEVALUATION OF PRODUCTS CONTAINING CHLORPYRIFOS

Dear Ms. Prichard:

On March 12, 2004, the California Department of Pesticide Regulation (DPR) issued a Notice of Decision to Begin Reevaluation of Products Containing Chlorpyrifos (the "Notice"). In the Notice, DPR requests chlorpyrifos registrants: (1) to identify the processes by which chlorpyrifos pesticide products are contributing to detections of chlorpyrifos in surface water at levels that exceed California Department of Fish and Game (DFG) water quality criteria (WQC) for the protection of aquatic life; and (2) to identify mitigation strategies that have been shown to reduce or eliminate chlorpyrifos residues in surface water in scientifically valid studies.

As the primary submitter of data supporting the registration of chlorpyrifos products in California, Dow AgroSciences (DAS) provides this as its initial response to the Notice.

1. Identify processes by which chlorpyrifos are contributing to detections.

Over the years, DAS, DPR, DFG, Regional Water Quality Control Boards, universities and others have generated extensive data relating to the processes by which chlorpyrifos and other organophosphate insecticides contribute to surface water detections. This research reveals that the two primary modes of transport into surface waters are direct drift during and immediately following applications adjacent to surface waters and surface water runoff from treated fields. Surface water runoff occurs primarily from storm events such as can occur during or following winter time dormant spray applications and from irrigation tail water discharges following field irrigation.

Examples of research on sources of chlorpyrifos and other organophosphate insecticides include:

- Organophosphorous insecticide concentration patterns in an agriculturally dominated tributary of the San Joaquin River. 2000. Poletika, N.N., Havens, P.L., Robb, C.K., Smith, R.D. Chapter 19 in Agrochemical Fate and Movement, Perspective and Scale of Study, T.R. Steinheimer, L.J. Ross, and T.D. Spittler, editors, ACS Symposium Series 751, Amer. Chem. Soc., Washington, DC.

- Surface Water Monitoring Information on Selected Insecticides in the San Joaquin River and Sacramento/San Joaquin River Delta Watersheds Correlated with Pesticide Use Data, 1990-2000. 2002. Dow AgroSciences LLC and Waterborne Environmental, Inc. April, 2002.
- Monitoring Surface Waters of the San Joaquin River Basin for Selected Summer-Use Pesticides, 2002. 2003. K. Starnes, F. Spurlock, S. Gill, K. Goh, H. Feng, J. Hsu, P. Lee, D. Tran, and J. White. DPR Environmental Monitoring Branch, Department of Pesticide Regulation, Sacramento, California. Report EH 03-03. November 2003.
- Transport of Pesticides from Irrigated Fields in Surface Runoff and Tile Drain Waters. 1985. Spencer, W.F., M.M. Cliath, J.W. Blair, and R.A. LeMert. USDA, Agricultural Research Service Conservation Research Report 31.

DAS believes that further research into the processes by which chlorpyrifos enters surface waters would not reveal any new information. Instead, DAS believes appropriate scientific studies have already been conducted and are adequate for DPR to identify the processes by which chlorpyrifos pesticide products are contributing to detections of chlorpyrifos in surface water. DAS would propose that DPR review with it the availability of relevant data to meet DPR's current requirements including data owned by DAS.

Additional surface water monitoring data will be generated over the next year from:

- (1) the Central Valley Regional Water Quality Control Board/University of California, Davis phase 2 monitoring program; and
- (2) the watershed coalition groups' monitoring programs being conducted under the Agricultural Return Flow and Stormwater Waiver program.

Such new data will not so much be source analysis data as it will be general toxicity data, but will significantly broaden the pool of water quality information in the agricultural drains of the Central Valley. DAS is coordinating with the Regional Board and with the various watershed groups regarding such monitoring programs and other phases of the Agricultural Waiver program. This and future water monitoring will also provide feedback on the effectiveness of label changes and other mitigation strategies as discussed below.

2. Identify mitigation strategies to reduce or eliminate chlorpyrifos residues in surface water.

Numerous studies have been conducted and strategies adopted to address off-site movement of pesticides. Key factors in reducing or eliminating chlorpyrifos residues in surface water include a) distance of application from surface water, b) pesticide load (rate, frequency of application, etc.), c) application method, and d) various Best Management Practices (BMPs). In fact, pesticide mitigation strategies are well understood, and further research does not seem warranted. Instead, DAS believes appropriate scientific studies have already been conducted and are adequate for DPR to identify appropriate mitigation strategies to effectively reduce or eliminate chlorpyrifos residues in surface water. Again, DAS would propose that DPR review with it the availability of relevant data to meet DPR's current requirements.

Examples of research into mitigation of chlorpyrifos and other organophosphate insecticides include:

- Characterizing agrochemical patterns and effective BMPs for surface waters using mechanistic modeling and GIS. 2001. Cryer, S.A., Fouch, M.A., Peacock, A.L., Havens, P.L. Environ Modeling Assessment 6:195-208.
- Water Quality Management Strategy for Diazinon in the Sacramento and Feather Rivers. 2001. Chapter 4.0 Identification and Evaluation of OP Pesticide Management Practices for Orchard Dormant Sprays. Sacramento River Watershed Program Organophosphate Working Group.
- Alternative Practices for Reducing Pesticide Impacts on Water Quality. 2002. Frank Zalom. Final Report to CalFed; Contract No. B81609 Project #97-C12. August 1, 2001 - July 31, 2002.

Some of these mitigation strategies have already been incorporated on recent label amendments that were required and completed for U.S. chlorpyrifos products pursuant to the most recent US EPA Reregistration Eligibility Decision. These label changes for chlorpyrifos products will implement effective mitigation strategies to reduce or eliminate chlorpyrifos residues in California surface water. Such label changes include buffer zones, restrictions on maximum use rates for certain crops, and restrictions on the number of allowed applications per year.

Finally, Dow AgroSciences and others are actively pursuing development and implementation of various agricultural BMPs.

- DAS has already begun informing and educating growers of pending label changes and will continue to do so once label amendments are approved by CA DPR.
- The San Joaquin Valley Drainage Authority has received PRISM grants that will be conducted by CURES (Coalition for Urban/Rural Environmental Stewardship) to investigate mitigation practices such as:
 - Evaluation of PAM/Calcium for reduction of OPs from field runoff
 - Evaluation of vegetated ditches to filter OPs from tail water returns
 - Evaluation of constructed wetlands to reduce OP transport from flow-through.
- Watershed coalitions are monitoring for chlorpyrifos and promoting the implementation of BMPs through public outreach and education. In particular, the East San Joaquin Water Quality Coalition and Westside San Joaquin River Watershed Coalition will be conducting public outreach in response to chlorpyrifos 303(d) listings in their respective watersheds. Publications will be made available prior to the 2005 use season that address various BMPs as well as new chlorpyrifos label language.
- The CalFed Drinking Water Program recently awarded a grant to CURES for a "Orestimba Creek Water Quality Pilot Project" that will conduct an economic analysis of BMPs including constructed wetlands, tailwater return systems, use of PAM/Calcium precipitants, irrigation scheduling, and other BMPs that impact irrigation return flows.

In summary, Dow AgroSciences looks forward to working with the Department to expedite approval of chlorpyrifos label amendments as well as to further identify existing studies on source, risk, and mitigation that the Department may want to require submission of for its reevaluation of products containing chlorpyrifos. As always, if you have any questions or wish to discuss this matter further, please do not hesitate to contact me.

Ann Prichard
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Sincerely,

Brian L. Bret, Ph.D.
State Regulatory Manager
ph: 916-780-7477
fx: 916-780-7478
email - blbret@dow.com

cc: Sterett Robertson, DAS Federal Regulatory Manager
Bryan Stuart, DAS Government Relations Manager, Western U.S.
CA Correspondence File
Debbie Ziehr, The Andersons Lawn Fertilizer
Kathryn Luba, Cheminova Inc.
Luz Chan, Drexel Chemical Company
Rebecca Lamas, Gowan Company
Michal Eldan, Luxembourg-Pamol, Inc.
Robert Ehn, R3 Ag Consulting
Andy Eimanis, Makhteshim-Agan of NA
Nancy Robey, Micro-Flo Company
Jeffrey Miller, Prentiss Incorporated
Scott Baker, United Horticulture Supply
Dana Thomas, Whitmire Micro-Gen Research Labs, Inc.